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(54) **TORQUE-BASED CATHETER ARTICULATION**

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See application file for complete search history.

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(57) **ABSTRACT**

A robotic surgical system configured for the articulation of a catheter comprises an input device, a control computer, and an instrument driver having at least one motor for displacing the pull-wire of a steerable catheter wherein the control computer is configured to determine the desired motor torque or tension of the pull-wire of a catheter based on user manipulation of the input device. The control computer is configured to output the desired motor torque or tension of the pull-wire to the instrument driver, whereby at least one motor of the instrument driver implements the desired motor torque to cause the desired pull-wire tension to articulate the distal tip of the catheter. The present embodiment further contemplates a robotic surgical method for the articulation of a steerable catheter wherein an input device is manipulated to communicate a desired catheter position to a control computer and motor torque commands are outputted to an instrument driver. The robotic system may further comprise a torque sensor. The robotic system may also incorporate closed loop feedback in which data from the torque measuring device is used to ensure that the torque in the motor or tension in the pull-wire closely
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